

	L #	Hits	Search Text	DBs
1	L1	141943	subscriber	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
2	L2	23729	subscrib\$4 near6 (user or enduser or client)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
3	L3	145114	1 or 2	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
4	L4	75209	(service or internet) near4 provider	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
5	L5	25065	3 and 4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
6	L6	6438	router and 5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
7	L7	1140	negotiat\$5 with (subnet or rout\$3)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
8	L8	128	6 and 7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
9	L9	254339	contract or agreement	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB

	L #	Hits	Search Text	DBs
10	L10	53	8 and 9	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
11	L11	26	10 and @ad<"20010530"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
12	L12	3	10 and @prad<"20010530"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
read 13	L13	26	11 or 12	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
14	L14	4367	provider near5 rout\$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
15	L15	7057	subscriber near5 rout\$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
16	L16	599	14 and 15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
17	L17	156	16 and 9	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
read 18	L18	7	17 and 7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB

read

	L #	Hits	Search Text	DBs
1	L1	6433	subscriber.clm.	US-PGPUB
2	L2	24060	rout\$3.clm.	US-PGPUB
3	L3	5392	(contract or agreement).clm.	US-PGPUB
4	L4	1702	negotiat\$5.clm.	US-PGPUB
5	L5	4	1 and 2 and 3 and 4	US-PGPUB

? show files

File 15:ABI/Inform(R) 1971-2005/Aug 05
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 File 148:Gale Group Trade & Industry DB 1976-2005/Aug 05
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 File 275:Gale Group Computer DB(TM) 1983-2005/Aug 05
 (c) 2005 The Gale Group
 File 621:Gale Group New Prod.Annou.(R) 1985-2005/Aug 05
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 (c) 2005 The New York Times
 File 475:Wall Street Journal Abs 1973-2005/Aug 04
 (c) 2005 The New York Times
 File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13
 (c) 2002 The Gale Group

? ds

Set	Items	Description
S1	1393305	SUBSCRIBER? ?
S2	68330	SUBSCRIB???? (6N) (USER? ? OR ENDUSER? ? OR CLIENT? ?)
S3	1407322	S1 OR S2
S4	3408185	(SERVICE? ? OR INTERNET OR INTRANET OR SUBSCRIB????) (6N) - PROVIDER? ?
S5	424030	S3 AND S4
S6	330776	ROUTER? ?
S7	14703939	CONTRACT? ? OR AGREEMENT? ?

	S8	8077	S5 AND S6 AND S7
	S9	9482	NEGOTIAT????? (10N) (SUBNET OR ROUT???)
	S10	7	S8 AND S9
read	S11	4	RD (unique items)
	S12	3224253	NEGOTIAT?????
	S13	588	S8 AND S12
	S14	428	S13 NOT PY>2001
	S15	17567	SUBNET? ? OR SUBNETWORK? ?
	S16	8	S13 AND S15
	S17	6	RD (unique items)
read	S18	6	S17 NOT S11
	?		

? t sll/medium,k/1-4

11/K/1 (Item 1 from file: 15)
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01793896 04-44887

Foreign ISPs look to the skies for Internet access

O Keefe, Susan

Telecommunications (Americas Edition) v33n3 PP: 65 Mar 1999

ISSN: 0278-4831 JRNL CODE: TEC

WORD COUNT: 888

DESCRIPTORS: **Internet service providers** ;

...ABSTRACT: access the Internet at all. As they seek to market demand, more and more foreign **service providers** are turning to fixed satellite-based systems in geosynchronous Earth orbit to provide access to

...TEXT: the Internet at all. As they seek to meet market demand, more and more foreign **service providers** are turning to fixed satellite-based systems in geosynchronous Earth orbit (GEO) to provide access...

...operations for Comsat World Systems. "It's not just Comsat: The overall pie is growing."

Providers of satellite-based **Internet services** cite several reasons for their growing popularity.

Time to market: ISPs often use satellites to...

...is sent directly from the United States to the destination country without making the multiple **router -to- router** hops used to **negotiate** Internet ground traffic.

Asymmetrical service: Because inbound traffic usually consists of a simple request for...

...or straight IP-based Internet services.

Intelligent networking and management: In many cases, once a **service provider** builds out its infrastructure with fiber, it continues to use satellites to supplement its coverage...

...to-Hong Kong route registers the highest traffic volume among all incoming Internet paths. The **agreement** consists of a 45 Mbps satellite link from the United States to Hong Kong and...

...the path of least delay: "Messages are sent back and forth between the traffic devices- **routers** -that indicate how much bandwidth is being utilized, how much congestion there is and how...

...especially true for regions just outside the boundaries of large population centers where T1, digital **subscriber** line and ISDN technologies haven't yet been rolled out. -It's all about how...

11/K/2 (Item 1 from file: 148)

DIALOG(R) File 148:Gale Group Trade & Industry DB
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15018772 SUPPLIER NUMBER: 91916294 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Will route control change the Internet? (IP Networking).
 Borthick, Sandy
 Business Communications Review, 32, 9, 20(5)
 Sept, 2002
 ISSN: 0162-3885 LANGUAGE: English RECORD TYPE: Fulltext
 WORD COUNT: 2821 LINE COUNT: 00238

... unreachability (or "brownouts") remain under study by Internet researchers. Route oscillation shows up when Internet **routers** fail to "converge" on new routes after an existing link or **router** goes down. Recent research also has documented that, at any given moment, up to about ...the RouteScience PathControl product, and his service improved within a week.

"Currently, enterprises pay the **service providers** for transmission **services**, but they lack protection against problems the **service providers** have inside their networks," said Susan Hares, the Internet researcher who chaired the NANOG Smart...the enterprise the tools and data they need to negotiate a fair price from the **service provider** (s)."

Not every customer will need to spend tens of thousands of dollars on a...

...from their ISPs. Some will be able to leverage their heavy traffic volume and BGP **routing** expertise to **negotiate** improved service. Others are likely to appreciate **route** control for the same reason they like the performance-monitoring power offered by Visual Networks and others for their frame relay **services** --as a way to hold **service providers** to the terms in their **service level agreements** (SLAs). And there are other, future benefits that customers might also get from route controllers ...shifts could overwhelm the traffic-engineering mechanisms the ISPs currently use to keep links and **routers** from overloading.

"The route control boxes and smart routing services would allow enterprises to quickly switch their traffic between carriers," Hares said. "Suppose **Service Provider 1** has a problem and the traffic of many customers is quickly shifted over to **Service Provider 2**. **Service Provider 2** may be overloaded by the additional traffic, causing problems with overloaded links or **routers**. These radical shifts in traffic do not occur today, because human operators must detect overloads...This allows them to load-balance traffic flows across multiple links and keep paths and **routers** from overloading.

"The traffic pinning is often based on a statistical load that is below...

...is done to allow for the fractal patterns inherent in Internet traffic and to keep **routers** from overloading. If rapid shifts of traffic flows from one provider to another hit the full contracted traffic load, and pushed past the maximums, they could cause the **routers** to overload."

Hares hastens to point out that **service provider** networks aren't threatened today, and may not be damaged if and when route controllers is a failure to converge on a new route--although the affected **routers** keep trying to do so by exchanging routing announcements. Persistent oscillations, generically known as "route...route reflectors, autonomous system (AS) confederations and multi-exit discriminators (MEDs). Depending on how neighboring **routers** in these configurations use these features and how they are programmed to select and announce...and Cisco technical lead,

the problem probably affects only a very small percent of core **routers**. Speaking at the IETF meeting in July, Retana said that about 10 percent of all and performance software and **service provider**. In spring of 2001, Mercury reported research data indicating that 35 percent of website performance...year study found that among those affected by these dark address blocks were cable modem **subscribers** and U.S. military networks.

Mercury Interactive's Gehringer speculates that ISPs are often unaware...if lots of customers moving lots of traffic flows trigger overloads and, indirectly, route oscillation, **service providers** need not worry about route control products and smart routing services interfering in hot-potato...changes into the ISPs' routing tables.

Theoretically, customers who are full BGP peers with their **service providers** could use the route controllers to inform their routing announcements, but this would require the **service providers'** cooperation. Customers also could use the **route** control data as a basis for **negotiating** better deals with their ISPs, including better performance on their traffic flows--although the outcome...see who's more important. And there are thousands of these deals going on--between **service providers**, between **service** and content **providers** and between customers and providers."

The simplest example is hot-potato routing: ISPs quickly hand...

...DESCRIPTORS: Bridge/ **routers** --

PRODUCT/INDUSTRY NAMES: 3661254 (Bridges/ **Routers** /Gateways)

11/K/3 (Item 1 from file: 275)

DIALOG(R) File 275:Gale Group Computer DB(TM)

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02703457 SUPPLIER NUMBER: 99614812 (USE FORMAT 7 OR 9 FOR FULL TEXT)

On the Far Side: **NAT and Session Border Controllers -- NAT plays a major, if low-profile, role in bringing VoIP security to firewalls.(Network Address Translation)**

Allen, Doug

Network Magazine, 30

April 1, 2003

ISSN: 1093-8001

LANGUAGE: English

RECORD TYPE: Fulltext

WORD COUNT: 2981

LINE COUNT: 00241

... and-forth requires costly media gateways that add latency and reduce quality, which affects customer **service** and **provider** costs. **Service providers** claim that the cost of conversion is five times that of native IP transport for...headstart on the technology.

SBCs offer four main service parameters: security, QoS and Service Level **Agreement** (SLA) assurance, signaling protocol interworking, and compliance with regulations.

Security is the SBC's bread...customer importance. SBCs must establish, maintain, and account for a media stream's QoS requirements. "**Service provider edge routers** support a wide range of IP Class of Service (CoS), queuing, and traffic management technologies...based on session admission control policies is necessary. In an int ercarrier IP communications environment, **service providers** must **negotiate** call **routing** and QoS parameters, and be able to share call detail records across network boundaries. Without these capabilities, **service providers** have no way of monitoring SLAs or protecting revenue for billed services in an IP...providers, but works for large enterprises as well. (It also

makes the Net-Net Session **Router** , a SIP **router** for providers.) "Our SBC supports a hosted NAT traversal feature which enables signaled sessions to ...NAT) or strips IP addresses exposed in signaling messages at the network border to hide **service provider** and upstream suppliers' infrastructure from attack.

- Produces QoS reports on a persession basis for SLA...s little configuration requirements for any IP phones or LAN gear, as long as the **subscriber** phone calls are routed to the outbound proxy list. (Some SBCs may require the firewall...

11/K/4 (Item 1 from file: 636)

DIALOG(R) File: 636:Gale Group Newsletter DB(TM)
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05212998 Supplier Number: 80377392 (USE FORMAT 7 FOR FULLTEXT)
MOBILE DIARY. (Company Business and Marketing) (Government Activity)
Mobile Communications Report, v15, n10, pNA
May 14, 2001
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 3695

... funding between wireless carriers and public safety answering points (PSAPs) was input to 911 selective **routers** that ILECs maintain. **Routers** receive 911 calls from LEC central offices and forward them to specific PSAP that serves...E911 rules, wireless carriers bear costs of hardware and software components that precede 911 selective **router** , including trunk from carrier's mobile switching center to 911 **router** and particular elements needed to implement certain signaling methods for delivering E911 Phase 1 information...

...bear costs of maintaining and upgrading E911 components and functions beyond input to 911 Selective **Router** , Sugrue said. In comments to FCC, most wireless carriers had argued that PSAP was responsible ...mobile switching center. But PSAPs contended appropriate line for determining funding was dedicated 911 selective **routers** of ILECs. Sugrue stressed to county that FCC still favored **negotiations** between parties as most efficient way to resolve such cost-allocation disputes. He said Bureau... that information to the equipment that analyzes and distributes," Sugrue said, referring to 911 selective **router** . "We thus agree with parties who believe that the appropriate demarcation point for allocating responsibilities and costs between wireless carriers and PSAPs is the input to the 911 selective **router** ." Letter said that because rates of wireless carriers weren't regulated, they had option of...additional spectrum." Reserve spectrum also will help narrowband PCS licensees remain competitive with other CMRS **providers** , FCC said. -----

National Park **Service** is considering Triton PCS right-of-way application to build wireless telecom site at Cape...week with no major merger conditions. Successful CFIUS review had been expected after companies reached **agreement** with FBI and Dept. of Justice earlier this year on national security issues. That auxiliary...deepened to \$76 million from \$52 million. Nextel said it added 695,400 global proportionate **subscribers** in quarter, ending period with 8.33 million. "While domestic **subscriber** growth was slightly better than anticipated, the company incurred slightly higher customer acquisition and handset...senior unsecured debt. Fitch cited company's strong first- quarter results, including adding 500,000 **subscribers** in each quarter last year, average

\$73 revenue per user, low customer churn. It said...June." Sonera said it planned to use proceeds to pay down debt. -----

Motorola signed 5 **contracts** worth \$146 million with China Mobile Communications to expand GSM networks in 5 provinces. Carrier expects to reach total of 11 million **subscribers**, with networks operational by year-end. Partnering with Cisco Systems, Motorola this month also will complete expansion of Beijing Branch GPRS network. New **contracts** are in addition to \$213 million GSM supply **contract** announced April 25 for expansion of China Mobile GSM900/1800 dual band network in Hunan...
?

? t s18/medium,k/1-6

18/K/1 (Item 1 from file: 15)
DIALOG(R) File 15:ABI/Inform(R)
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00992078 96-41471

The picture emerges

Williamson, John

Telephony Network Management Supplement PP: 22-27 Mar 6, 1995

ISSN: 0040-2656 JRNL CODE: TPH

WORD COUNT: 3712

...TEXT: and private network domains and have operations requirements that stretch across different infrastructure, operator and **service provider** domains.

As a result, operators now must maintain and access much more customer and business...

...of a customer's part of the network to a particular customer to verify service **agreements**, among other things. Operator responsibilities can now extend to maintaining records of **router** configurations on customer premises, and even what applications are running on a customer's local...

...reside in network elements, intelligent agents are pieces of software that can communicate, cooperate and **negotiate** with each other. It is hoped that from this modest set of attributes will spring...at Nynex Science and Technology.

AT&T Network Systems believes that the requirement for defined **subnetworks** is increasing. In a video delivery system, for example, this need can't take the...

...cable customers, where the latter is a different entity to the operator, with a video **subnetwork** view. Above this **subnetwork** level, different traffic types would be managed differently and be subject to different business processes...

...the introduction of corporatewide videoconferencing will be analogous to the the introduction of bridges and **routers** in enterprise networks in the 1980s. These network elements tended to start off as individual...

...services, takes operators into uncharted waters.

With set-top boxes and fiber or asymmetrical digital **subscriber** line (ADSL) terminations in residences, the number of network elements that must be managed could...OmniPoint program.

Other current NMF activity is looking at issues such as trouble ticketing between **service providers** and performance reporting from **service providers** to customers, and work has started on additional high-level application programming interfaces (APIs) for...

...work with the ATM Forum to provide the latter with network management requirements from the **service provider** 's point of view. The ATM Forum has furthered standards for element management interfaces for...

18/K/2 (Item 1 from file: 16)

DIALOG(R) File 16:Gale Group PROMT(R)

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07652880 Supplier Number: 63499819 (USE FORMAT 7 FOR FULLTEXT)

Building-Centric Service Providers .(Industry Trend or Event)

Michael, Bill; Muraskin, Ellen

Computer Telephony, v8, n7, p82

July, 2000

Language: English Record Type: Fulltext

Document Type: Magazine/Journal; Trade

Word Count: 7906

Building-Centric Service Providers .(Industry Trend or Event)

... telecom provider winning (or more likely, buying) primary access to a building through special financial **agreement** with the landlord would seem an unfortunate retrogression, rather than a step toward freeing up...

...CT and IP telephony developers, resellers, and those who may not have previously considered themselves **service providers** .

In New York and other major cities, high-end residential properties, including apartment buildings and...

...has been done by a class of upstart CLECs, often known as OSPs (on-site **service providers**) or BLECs (building LECs). What's new about these players (several of whom you'll...

...lighting up a building often includes laying expensive new fiber in the risers, and purchasing **routers** , switches, and other hardware to connect to the outside world. But the upfront investment is...point, most of the carriers we talked with are using standard stuff in their networks: **routers** , Ethernet LANs, ATM switches for data, circuit switches and TDM gear for voice. The biggest...

...a CO box, but use essentially the same principle. Multiple DSL circuits linked to each **subscriber** in the building are terminated on the access mux in the basement, and traffic is...

...of up-and-coming companies like Appian Communications and Tenor Networks will supply the switches, **routers** , and service creation platforms necessary to make this happen.

The good news for makers of...

...recruiting the basement as a new point of presence. So a quickly growing group of **service providers** is out there looking for help. Particularly when it comes to delivering telephony features and...

...replace legacy equipment (PBXs, Class 5 Centrex) with more efficient convergence technologies. And by already **negotiating** the necessary bargains with landlords and the real estate community, the carrier can pave the...the applications."

While certain aspects of Allied Riser's business do indeed resemble an application **service provider** , the company's managed network infrastructure extends beyond a narrow definition of ASP. Underlying the...

...should be used as a service delivery mechanism as well, says Guthrie. This means that **subscribers** should be able to use it to schedule and administer ARC's audioconferencing services, for...

...a more centralized point in the network, and IP phones at the customer premise. If **subscribers** wanted to keep ...their individual needs." This idea of service delivery highly tailored to individuals and communities of **subscribers** helps distinguish Everest positively from more traditional data LECs.

The company's high-touch, service...

...serve. "Our touchpoint with the customer," emphasizes Varello, "begins as soon as that customer starts **negotiating** his lease, not at an arbitrary point in a call center."

ONSITE ACCESS: PARALLEL VOICE...

...were issues, too, Knicely adds, with managing the resource of IP addresses and mapping IP **subnets** to VLANs.

To solve the problem, he explains, "we took a clean-slate approach. We...

...pulls pre-terminated copper to the actual customer premises suite and installs a Netopia DSL **router** with an Ethernet hand-off. The Netopia **router** also has a built-in hub, so customers can simply attach several hosts.

"We control...

...product the customer buys from us. That's the data side," explains Knicely. The DSL **router** also supports DHCP for dynamic allocation of IP addresses and NAT. In the basement, a...paid for on that shared facility? That's where you have to have an IP **router** in the basement or some device that does rate shaping and allows you to control...

...to control the amount of IP bandwidth they supply, but the amount per application. "Essentially, **routers** look at layer 3, the IP layer," Knicely explains. "Xedia focuses on class-based queuing...
...major markets." Revenue from long distance gets shared with the building owner, at a percentages **negotiated** on a case-by-case basis.

Internet access is supplied through up-stream **Internet** access **providers** and Cisco 75xx **routers** in the company's major metro POPs. In addition to Internet access, Onsite Access offers...

...managers) spend their time in the building, getting to know and serving the customers.

"All **service providers** are not created equal in this MTU space," Knicely says. "To be able to support...

...insurance, and office furniture. The idea is ultimately for landlords to own the communications infrastructure, **contract** its management to PhatPipe, pocket the difference between wholesale and retail telecom and Internet services...

...detailed things, like allowing businesses to invoice online." While the applications are supplied through other **service providers**, PhatPipe will provide one point of contact and one bill, one volume-discounted price, and...from PacBell. To spread beyond their home state, Robinson says, they're working out CLEC **agreements** region by region.

PhatPipe's first two buildings will come online this year, representing almost...

...economy of scale. PhatPipe equips these buildings with Cisco Catalyst 6500 family switches, series 7500 **routers**, a Cisco Call Manager IP phone

system, plus the necessary gateways. They may also install...

...Cisco Works 2000 Voice Manager, a web-based manager for the voice-enabled 7500 series **routers** .

A common Ethernet backbone, which can be accessed by any tenant, will connect to the hubs and **routers** and to the voice trunks or the Internet, and to a common platform for VoIP...

...bandwidth, and will use RC Networks' RC-8000 SDSL Access Concentrator and RC-2000 SDSL **Router** .

When it comes to selling customers, Robinson says, "we use the landlords as a sales...

...starters, a landlord knows when tenants move in, expand, or move out. If most telecom **contracts** are two years long, knowing a tenant's move-in-date tells marketers when they...

...offering, it is one of the enhanced service menu items offered as an option to **subscribers** .

At the moment, these enhanced services are relatively basic ISP offerings, like e-mail and access to the **subscriber** 's account, letting them add, drop, or reconfigure services from the desktop. This function can ...

...copper to provide lifeline POTS. In the basement, an ATM switch aggregates traffic from a **router** (for data) and a digital loop carrier (for voice), sending it all back to the...

...means (at least in some cases) it can replace the need for a separate switch/ **router** and backhaul traffic directly to to the CO or metro POP. Incorporating an ATM switch...IP Centrex, perhaps well before other segments of the LEC market.

Like most MTU/MDU **service providers** , WaKuL's pitch to property owners is based on bundled services and revenue sharing. In...

...the needs of in-building providers. The company's major product, PurePacket is an IP **router** and access gateway, designed for the network edge (which could also be a building basement...

18/K/3 (Item 1 from file: 148)

DIALOG(R) File 148:Gale Group Trade & Industry DB
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16071250 SUPPLIER NUMBER: 101968160 (USE FORMAT 7 OR 9 FOR FULL TEXT)

IP multihoming: reducing Internet access down time.

Terrill, William

Business Communications Review, 33, 5, 32(5)

May, 2003

ISSN: 0162-3885

LANGUAGE: English

RECORD TYPE: Fulltext

WORD COUNT: 3246

LINE COUNT: 00270

... enterprise to business partners and/or customers. These connections can be through one or multiple **service providers** , and can originate from one site within the enterprise or from geographically ...will not produce undue financial hardship to your firm, instead of multiple connections to multiple **Internet service providers** , alternatives,

such as dial back-up, may be acceptable.

The key is how long an...enterprise to incrementally increase bandwidth as needed--e.g., adding an additional T1 or digital **subscriber** line (DSL) connection rather than migrating to a T3. The total throughput can approach the...speed, lower-cost connections: By selecting multiple, lower-bandwidth connections from the same or different **service providers**, it is possible to **negotiate** a lower overall cost for the bandwidth utilized. For example, multihoming two T1s and a...

...most multihoming solutions can distribute traffic between different IP links based on numerous factors. ISP **contracts** often have different pricing tiers based on the amount of bandwidth used by an enterprise... redundancy. Keeping the enterprise connections up, running and available, regardless of whether one or more **service providers** is experiencing an outage, can provide significant payback.

Route Diversity is Key

Once it has...if there's a failure at a shared point within the network all of your **service providers** /ISPs can become disconnected from the **Internet**. If the ISPs have collocated point-of-presence (POP) within a carrier's facility, or...that outage can potentially overwhelm the internal network bandwidth.

Load Sharing vs. Load Balancing

Once **service providers** have been selected and route diversity has been assured, an enterprise must decide whether load...

...cost-effective method of utilizing the multihomed environments. Load sharing can be implemented with existing **routers** and BGP configurations. Load sharing allows data to be sent over any of the links...devices actually monitor the performance of the different links to the Internet by communicating with **routers** within the ISP networks and with sites scattered around the world and measuring the response...

...basic options for multihoming are: II Load sharing, using BGP configurations on the existing edge **router** (s). This solution, shown in Figure 1, is relatively simple, provided your organization has the dynamic adjustment of loads; instead, the **routers** generally use hop-count to determine which link data is to be sent over, and...

...Figure 2), available from companies like RouteScience Technologies, netVmg and Proficient Networks, sit behind the **routers** but out of the flow of traffic. They monitor the traffic and performance of each link and modify the BOP tables in the **routers** to adjust the flow of traffic between the different links. The **routers** then direct traffic based on the modified BGP tables.

BGP route controllers have an advantage...

...a single point of failure within the network. If a BGP route controller fails, the **routers** continue using their existing routing tables to distribute traffic. In addition, the performance of the link performance and update BGP tables in the **routers**.

A potential disadvantage, however, is that BGP route controllers do not direct outgoing traffic on a connection-by-connection basis. They set up the "current" best route in the **router** and then all of that **router**'s traffic is based on those tables. This means that all traffic to a given IP address, **subnet** or autonomous system will go to the same link, even if that link is overloaded. The BGP **router** controllers eventually will adjust the **router** tables to compensate for the overloaded link (or reduced performance, tariff level policies, ...being directed to another

link

* Link-load balancers (in-path load balancers), sit between the **routers** and the enterprise network and direct traffic to different **routers** connected to different IP providers (Figure 3).

Like BGP route controllers, these devices monitor the...

...on policies set by the enterprise manager. But link-load balancers do not manipulate the **router** BGP tables; instead, they send traffic to one of the **routers** connected to the Internet. Some of ...load balancers is that they must handle all the traffic that flows to the edge **routers**. They're potentially handling a lot of throughput and, therefore, redundancy capabilities are required. The...com)

RouteScience Technologies

(www.routescience.com)

RELATED ARTICLE: Multihoming Considerations

* Diverse routes: Will the selected **service providers** actually provide multiple paths between the enterprise and the Internet with no hidden single-point-of-failure?

Without true diverse routes, multihoming's reliability and availability advantages can disappear. Most **service providers** will, for a price, verify the diversity of their routes between locations. When dealing with multiple **service providers**, try to make sure that they do not use any common carrier or POP within...

...to advertise the enterprise IP addresses in the granularity needed?

When deciding which ISP to **contract** with, it is often as important to learn their policies on the use of BGP, as it is to determine if they provide route diversity. The **service provider** should provide details about the policy regarding what **subnet** range it is willing to advertise. Some will not advertise anything less than a 24-bit **subnet** (255.255.255.0); if your enterprise has several smaller IP address ranges, it may not be possible to get some **service providers** to accept and advertise those smaller ranges.

Even in those cases where the ISP will advertise smaller routes, other Internet **routers** may filter them out, and either aggregate them with other addresses or simply not accept or advertise them to other **routers** in the Internet. In these situations, it might be best to use the IP addresses supplied by the **service provider** (s) and manage the incoming and outgoing traffic using NAT at the **routers**, or install link-load-balancing devices on the enterprise network.

* Internal Expertise: Does the enterprise...

...skills and tools that allow BGP to safely advertise and accept routes from the Internet **routers**? Are onsite experts available at all locations that might need multihomed environments?

If your enterprise has personnel available with the skills to manage the **router** BGP configurations, there may be no need to employ additional load-balancing devices to create...article, there are several options for implementing multihoming. Load sharing using BGP configurations on existing **routers** can reduce capital costs by using already installed equipment, but requires more internal expertise and cooperation between the **service providers** and the enterprise. Load balancing with either BGP route controllers or link-load balancers requires a capital expenditure but much less internal expertise and virtually no cooperation with the **service providers**.

* Inbound traffic considerations: Does inbound traffic into the enterprise network need to be balanced across...your projections include

the total cost of fully redundant systems--redundancy-is needed in the **routers** , appliances and DNSs that make up the infrastructure of the multihomed environment. Any link-load...

...Can the selected product provide the management capabilities required for the enterprise policies?

Whether BGP **routers** or some combination of BGP route controllers or load-balancing appliances is selected, ongoing management the distribution of the traffic among the different **service provider** connections should be carefully considered. If cost containment is a primary consideration, verify that the **service providers** . Clear, concise reports in an easily understood format are essential, and take your time when...

18/K/4 (Item 2 from file: 148)

DIALOG(R) File 148:Gale Group Trade & Industry DB
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13263298 SUPPLIER NUMBER: 72470085 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Best Practices For VPN Implementation.(Industry Trend or Event)
Browne, Brian; Lewis, Cindy; Hamilton, Rich
Business Communications Review, 31, 3, 24
March, 2001
ISSN: 0162-3885 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 3971 LINE COUNT: 00333

... and use of tagging technologies to isolate client traffic over networks belonging to a single **service provider** (known as the Peer Model). The former strategy offers high levels of assurance to the...

...strategy scales well using classical internetworking techniques, but requires high levels of trust in the **service provider** .

This article will discuss the best practices for implementing VPN solutions in order to migrate...

...dial solutions to high-speed shared broadband solutions. It will also present the issues surrounding **service provider** -based VPN solutions.

VPN Protocol Evolution

IPSecurity (IPSec) is a framework of open standards that...

...can set up the VPN gateway to issue dynamic configuration information (e.g., IP address, **subnet** mask, DNS servers, WINS servers) to the VPN clients. This allows an organization to add...

...a remote access VPN. In many such cases, NAT may be implemented on the DSL **router** , with the VPN client software installed on a computer that sits behind the **router** .

To deal with such instances, VPN product vendors have built IPSec NAT traversal capabilities into...organization's network. The VPN gateway itself can be protected through either the external border **router** or through the firewall itself. Figure 1 illustrates a topology where the firewall protects the...

...i.e., VPN gateways) securely exchange (pre-share) a secret key prior to any tunnel **negotiation** . The method of exchanging the keys is typically some type of manual process, such as...routing redundancy protocols such as Border Gateway Protocol (BGP) for link resilience and Hot Standby **Router** Protocol (HSRP) or Virtual **Router** Redundancy Protocol (VRRP) for **router**

resilience should be deployed.

Vendor products approach redundancy in varying ways. An organization should consider...

...organization that requires a high degree of meshing among its sites. Presented with this reality, **service providers** have embarked on the path of adding value to their service through managed VPN offerings that offload much of the operational responsibilities from organizations.

The traditional approach for **service providers** has been to provide an IPSec-based managed VPN service. However, the subsequent operational challenge...

...one in which the enterprise network represents a "higher layer," independent of the "lower layer" **service provider** network. ATM, frame relay, and IPSec VPNs are examples of overlay networks. For example, with ...

...and management of N-squared tunnels (or links) that are overlaid on top of the **service provider** network. This creates the operational challenge.

The alternative, the peer model, addresses this issue by having the enterprise network peer with the **service provider** network. Instead of requiring each "gateway" to know about every other gateway within the organizational VPN, it needs to know only about its **service provider** peer. The **service provider** network is responsible for routing the traffic to the appropriate gateway within the organization and...

...that can support thousands of sites per VPN and hundreds of thousands of VPNs per **service provider**.

* Optimal routing of customer traffic through the **service provider** network.

* IP Class of **Service** (COS) for multiple classes of ...membership and provisioning, which allows rapid deployment.

* Support for multiple VPNs with strong service level **agreements** (SLAs) for quality of service (QOS).

* Inherent provision of the privacy and QOS of ATM without tunneling or encryption.

* Ability of the **service provider** to implement low-cost managed **services**.

* **Service** delivery independent of the access or transport technology.

* Transparent support for private IP addresses, with address translation not required to support independent **subscribers** who have an overlapping address space.

* A base for future deployment of additional services, such...

...Woody Weaver is director, professional services at Callisma, a network consultancy helping enterprises and **service providers** design and deploy networks for strategic business value.

Streamlining Connections

One of Callisma's most...

...the requirements of being easily incorporated into an existing Internet connection behind the ISP-provided **router** and firewall. The RedCreek products perform 168-bit Triple DES encryption. Authentication and access control...

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06403678 SUPPLIER NUMBER: 13414732 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Linking LANs: making the WAN connection. (three methods for linking local area networks to create wide area networks are described) (includes related articles on WAN characteristics, a LAN-to-LAN glossary and LAN connectivity services)

Derfler, Frank J., Jr.

PC Magazine, v12, n5, p183(14)

March 16, 1993

ISSN: 0888-8507

LANGUAGE: ENGLISH

RECORD TYPE: FULLTEXT; ABSTRACT

WORD COUNT: 6361 LINE COUNT: 00504

...ABSTRACT: a stream to a single destination: circuit-switched service uses an internetworking device (a bridge, **router** or gateway) to dial up another LAN, transfer the data and hang up; while a...

... And not all modems will be able to transfer data coming from the bridges and **routers** linking your LAN segments.

Putting together that link isn't difficult if you make the...

...system's needs, to pick the right digital data service to supply those connections.

Bridges, **routers**, and gateways all pass data from the individual LANs to special equipment that attaches to...

...and confusing. When you use local-access service, you will receive separate bills from each **service provider**. With direct connection, the interexchange carrier consolidates all bills. As a general rule, try to...

...Europe, and much of Asia are fully digital.

With circuit-switched services, a bridge or **router** dials another bridge or **router** through the phone network. Using a data-link control protocol such as IBM's Synchronous...

...more widely used High-level Data Link Control (HDLC), the sending LAN's bridge or **router** encodes the data onto the digital line and passes the data to the receiving LAN's bridge or **router** (see the diagram that accompanies "Circuit-Switched Service").

Circuit-switched service, in which the sending...second channel as a voice telephone line. (A third 16-Kbps line is used to **negotiate**, establish, and tear down the circuit.)

A lack of consensus throughout the industry about certain...

...monthly basis instead of calling it up as needed.

With leased-line service, bridges or **routers** use a data-link control protocol to transmit data. Line speeds range from 19.2...A third group of carriers, called VAN (value-added network) or PDN (public data network) **providers**, also offer packet-switched **services**. VANs and PDNs provide a variety of services, ranging from terminal protocol translation (3270 to...

...1.544 Mbps); the network will adjust by buffering the packets. For example, the sending **router** can dial into CompuServe or MCI Mail at 9.6 Kbps and the receiving **router** can pull the data off the packet-switched network at 1.544 Mbps. This buffering...

...frame relay, is the use of a committed information rate (CIR). The CIR is an **agreement** on the maximum amount of data that the network guarantees

it will carry for you...

...you pay a usage fee based on the number of megabytes of delivered data. VAN **providers** such as CompuServe, GE Information **Services** , and Tymnet will integrate the necessary data links of your interLAN connection, so you can...does not read the network address of the packet, bridges are protocol independent and (unlike **routers** or gateways) can route packets without understanding them. Bridges are also typically cheaper and easier to install and manager than **routers** .

central office (CO) The telephone-switching station nearest the customer's location. The central office...

...and controls the flow of data between a network portal, such as a bridge or **router** , and the channel service unit.

frame bandwidth allocation The sum of the committed information rates associated with all the permanent virtual circuits for a specific customer.

gateway Like bridges and **routers** , a method of connecting two local area networks. Gateways translate between two LAN protocols. For...the serial data stream coming from an internetworking device such as a bridge or a **router** into packets for a packet-switched network.

packet-switched network A network consisting of a...

...30 B channels and one D channel--the equivalent of one European E-1 link.

router A device used to connect the wires from one or more networks together. **Routers** examine the network address of each packet. Those packets that contain a network address different from the originating PC's address are forwarded onto an adjoining network. **Routers** also have network-management and filtering capabilities, and many newer **routers** incorporate bridging capabilities as well. Since **routers** must read network addresses, they must know the network protocols for the packets they receive; for example, a **router** receiving NetWare packets must support IPX, Novell's network protocol. **Routers** offer finer traffic control than bridges but are typically a bit more expensive and much...

...U.S. service-access points. AT&T's frame relay service is priced for each **subscriber** on a contractual basis. The cost is initially based on the speed of the access...mode services. MCI supplies everything, including the CSU/DSU.

MCI prices frame relay on a **contract** basis and can arrange for either fixed-rate or usage-sensitive pricing. The usage-sensitive...

...relay network.

SprintNet offers several options for connecting LANs. SprintLink is a SprintNet TCP/IP **subnetwork** , so if you already use TCP/IP **routers** you can simplify your network operation by using TCP/IP connections. Sprint already has its...

...the company intends to aggressively market ATM services.

Sprint will arrange for channel-access equipment, **routers** , and access lines; it provides all network services, including consolidated billing.

Williams Telecommunications Group (WilTel...

18/K/6 (Item 1 from file: 275)

DIALOG(R) File 275:Gale Group Computer DB(TM)

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02649284 SUPPLIER NUMBER: 92222474 (USE FORMAT 7 OR 9 FOR FULL TEXT)
European ISPs: Where Thinking Big Matters Most -- Internet shutdown.
Bankrupt providers . Here's an Internet service acquisition strategy
for the new millennium. (Industry Trend or Event)
 Salus, Peter H.
 Network Magazine, 52
 Oct 1, 2002
 ISSN: 1093-8001 LANGUAGE: English RECORD TYPE: Fulltext
 WORD COUNT: 2269 LINE COUNT: 00185

European ISPs: Where Thinking Big Matters Most -- Internet shutdown.
Bankrupt providers . Here's an Internet service acquisition strategy
for the new millennium. (Industry Trend or Event)

... only one provider. Even small businesses need to think like the big guys and purchase **Internet** access from multiple **providers** that deliver optimum performance in the targeted regions.

That might sound like contravening conventional wisdom...

...a single major provider can in theory yield better performance by knocking out a few **router** hops, avoiding those congestion points, and taking advantage of favorable routing policies-at least most...
 ...www.matrixnetsystems.com) hears against selecting multiple ISPs. Yet in truth, when customers analyze specific **routers** , often the performance difference between going on-network within Europe and between networks within Europe...

...In late 2000, some traffic traveling from Singapore to Europe was slowed due to a **router** fault in New Zealand. Such things don't get much publicity, but they have an...

...down on specific routing architectures, and those same sales types prattle on about fault-tolerant **routers** , with redundant control planes and such.

Yes, many providers build highly resilient networks, which insure...

...biggest networks, that's hardly obvious-network diversity is far more complex than replicating a **router** configuration or running resilient lines to an office building, though it includes those as well...capacity the show's viewers would require. The impact on IBM.net's thousands of **subscribers** was horrendous: They had no Internet access.

Capacity should run over diversely routed cabling runs...

...single point of failure.

Thirty-eight percent of domains locate their nameservers in the same **subnet** . Running a brief WHOIS query backs up this point. UUNET, for example, uses the **subnet** 198.6.1 for its two nameservers. Genuity uses 4.2.49 for its nameservers.

By keeping all of the nameservers in a single **subnet** , ISPs are asking for trouble. An error in one nameserver will instantly propagate to the other server. For example, all four of Microsoft's DNS servers share the same **routers** , meaning that all of them are vulnerable to the same hardware glitches or technician errors...

...Sohn. "At around 6:30 p.m. PST we made a configuration change to the **routers** on the DNS network." The next day, Microsoft admitted that a second shutdown was the...the price tag. However, keeping multiple providers will deliver greater leverage when it comes to **negotiations** . And it might be that it's more economical, as well. A 30-minute outage...

DESCRIPTORS: **Internet service provider ; ...**

...Cooperative **agreement** for service distribution...

...Government **contract** management

PRODUCT/INDUSTRY NAMES: 4811522 (**Internet Access Providers**)

?